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ABSTRACT

Persistence in educational pursuits is strongly related to the prestige level and income level of an occupation. Personality correlates of persistence in education were examined in the context of a causal model of attainment in an eight-year longitudinal study of a nationally representative sample of 2213 young men. Results imply that anxiety and commitment are moderately good predictors of presistence in education even when social background and intelligence are statistically controlled. Schooling experiences, especially grades received, influence the development of personality characteristics that are useful in achieving later-life educational and occupational status. Successful school experiences strengthen student bonds to the school social order. Students react to academic failure by drawing away, and by becoming resentful, detached, and anxious. The implications for schools as socializing agents suggest that schools must accommodate an increasingly heterogeneous mix of students with divergent needs and demands. (Author)

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Personality and Persistence in Education:

A Longitudinal Study

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Abstract

Personality correlates of persistence in education are examined in the context of a causal model of attainment in an eight year longitudinal study of a nationally representative sample of 2213 young men. Results imply that anxiety and commitment are moderately good predictors of persistence in education even when social background and intelligence are statistically controlled. Schooling experiences --especially grades received--influence the development of personality characteristics that are useful in achieving later-life educational and occupational status. Theoretical and practical implications for the role of schooling in the socialization of youths are discussed.

More than a decade of research on social mobility in the United States has indicated that parents transmit their socioeconomic advantage to their children primarily through education (Blau and Duncan, 1967; Duncan, Featherman and Duncan, 1972; Featherman and Hauser, 1978; Jencks et al., 1972; Jencks et al., 1979; Sewell and Hauser, 1975; Sewell, Hauser and Featherman, 1976). Persistence in educational pursuits is strongly and causally related to the prestige of the occupation one acquires as well as the income level one enjoys. Jencks et al. (1979) report that men who complete high school can be expected to attain occupations whose prestige ratings are about one-quarter of a standard deviation higher than those attained by elementary school graduates of similar backgrounds and ability levels. Similarly, completing college produces an advantage of about one standard deviation of prestige. Increases in earnings due to schooling are also sizeable: Completing high school amounts to a 15 to 25 percent increase and completing college amounts to a 30 to 40 percent increase, both among individuals from similar backgrounds and ability levels.

Questions about what personal attributes lead to success in educational and occupational pursuits have been the topic of much inquiry in the social sciences during the past decade. Sociologists stress the importance of "opportunity" in terms of family background, as well as mental ability, schooling experiences such as influence from significant others to continue schooling, successful academic performance and the shaping of ambitions. Non-cognitive attributes of individuals' personalities are generally excluded from sociological models, although a few exceptions (to be discussed later) exist. Psychological research on this topic comes mainly from industrial and vocational psychologists whose interest is in matching individuals'

characteristics to job characteristics, and for predicting such outcomes as job turnover and job satisfaction. But educational and personality psychologists have also contributed to knowledge in this area. Evidence from research in these fields suggests an array of non-cognitive personal attributes that is related to success in educational and occupational endeavors.

This paper draws from both the psychological and sociological traditions to examine the nature of the relations between non-cognitive characteristics and persistence in education. It uses data from a nationally representative sample of 2213 young men collected at five timepoints. These data, collected as part of the Youth in Transition Project (Bachman, 1975) contain a wide range of personal characteristics as well as measures of family background, schooling experiences, and demographic characteristics of the respondents, and are particularly useful for examining how young mens' careers unfold as they move from adolescence into adulthood.

Background

The evidence linking persistence in education with non-cognitive characteristics is largely indirect. Theories of career development (Holland, 1959, 1976) and empirical studies on the topic (Astin and Panos, 1969; Baird, 1970; Darley and Hagenah, 1955; Holland, 1978; L. Gottfredson, 1977; Guilford, 1959; Guilford, et al., 1954) suggest that vocational interests and aspirations are related both to traditional dimensions of personality (as measured by personality inventories such as the CPI, MMPI, EPPS, and 16PF) and level of education attained. Scales measuring other aspects of personality--the Status scale (Holland, 1978), the Occupational Level

scale of the Strong Vocational Interest Blank, and the Interpersonal Competency scale (Holland and Baird, 1968)--are also correlated both with persistence in education and with personality factors, including ascendancy, sociability, emotional stability, aggression, surgence, adventurousness and self-sufficiency (from the 16PF) and capacity for status achievement via conformity, achievement via independence and intellectual efficacy (from the CPI).

Personality characteristics are also related to another measure of academic success--grades. Lenning, Munday, Johnson, Vanderwell and Brue (1974) review multiple studies which suggest that conformity, introversion, responsibility, lack of hostility self-assurance and overall adjustment are related to academic success. Gough (1964) also found that internalization of the prevailing value system and achievement motivation (from the CPI) are related to grade point average.

The correlational evidence of associations reported in these studies was adduced primarily in support of the validity of various personality scales, and serve only to whet the appetites of those interested in the determinants of academic success. Many questions are raised: To what extent are the effects of these non-cognitive characteristics independent of the effects of other known determinants of academic success? Are the large number of personality traits associated with success indicators of more general personality dimensions? How do these non-cognitive traits operate in the context of the schooling process?

Hints about the answers to these questions may be gleaned from sociologists' attempts to model the educational attainment process. Although early models of attainment attributed success primarily to individuals' cognitive attributes and social class background, subsequent

models have incorporated social interactionist notions about the importance of self-concept, motivation and the expectations of others. The Wisconsin model of status attainment (Sewell, Haller and Portes, 1969) asserts that much of the advantage which accrues to persons of higher social class backgrounds results from socialization experiences. A few studies in this area have attempted to measure characteristics resulting from such experiences.

Porter (1974) hypothesized that the extent to which a person accepts his or her social role determines educational success. He used Project Talent data to show that a scale measuring the degree to which the subject projects "a self-concept...aligned with a stereotype of a solid middle-class American youth..." (page 308) was predictive of high grades and educational attainment, controlling on social class background and ability. His conformity scale included items covering fondness for sociability, avoidance of hurting others' feelings or expressing one's own affect, and maintenance of self-control.

Other studies (Coleman, et al., 1966; Kerckhoff and Campbell, 1977) showed that scales similar to Rotter's (1966) internal-external control scale measuring one's feeling about the extent of control over one's life and fortunes were predictive of measures of academic success and plans to attend college. Measures of self-concept have also been used in models of status attainment (Coleman, et al., 1966; Portes and Wilson, 1976; Wilson and Portes, 1975). Both global measures of self-concept and self-concept of academic ability have been shown to predict educational attainment and other measures of academic success.

Straightforward interpretation of the findings of these studies is hindered by problems of construct validity. Sociologists tend to include in their models those variables, such as self-concept of ability (usually based on self-rating of ability) which correlate highest with the criterion. Results based on such measures may indicate not that a powerful dimension has been identified, but that an alternative measure of the criterion has been found. Then too, the likelihood of reciprocal causation between the predictor and the criterion also renders findings questionable. For example, most studies using measures of internal vs. external control assume that sense of internal control is causally prior to higher grades and achievement scores. But, the alternative direction of causality is equally likely in many studies, and would not be discordant with Rotter's theory: Those who are frequently rewarded for effort (in the form of good grades, for example) are likely to develop a sense of internal control. Questions about the underlying dimensionality of the observed variables are also not addressed in these studies.

A few large scale studies of educational attainment have included more carefully measured personality dimensions. A report by Turner (1978) indicated that traditional personality measures--introversion and neuroticism --added significantly to the predictive power of a model of educational attainment including family background measures. Bachman et al. (1978) gathered and analyzed data for the Youth in Transition project--a nationwide longitudinal study of young men--which include a wide range of personality scales as well as social and demographic data, and information on educational and occupational experiences. Zero-order correlations of personality measured when the boys were in tenth grade with educational attainment measured one year after high school indicate that a constellation of

noncognitive characteristics typify the college-goer. Such a person has a favorable impression of himself, values self-development, wants to be useful, feels in control of his destiny, and possesses conventional social skills. By contrast, the person who drops out of high school or just finishes high school complains about physical ailments more often, is more aggressive, anxious, irritable, tense, depressed, resentful and does not value education or academic achievement.

A recent study of post-high school plans (Schmitt et al., 1978) analyzed the relative effects on school plans from four sets of predictors: demographic, economic, high school experience, and psychological. Among the psychological variables included were self-esteem, locus of control, needs and interests. Each set of variables and the combined sets were used to discriminate among six groups defined on the basis of post-high school plans. The discriminating power of the psychological variables compared favorably with that of the other sets: Only the high school experience variables--including grades and curriculum enrollment--explained more variance in the criterion. The results of the discriminant analysis on the combined set of variables indicated that several of the psychological variables continue to discriminate among the groups even when more traditional predictors--father's education level, family income, high school curriculum, high school grades--were included.

The most thoroughgoing attempts to unravel the effects of non-cognitive characteristics on academic success have focused on grade point average in school as the criterion of success. Smith (1967) examined the effect of peer ratings on 42 bipolar traits on academic success in three populations (high school, college and nursing school) and found (1) that the

traits could be summarized by five underlying factors similar to those suggested by Tupes and Christal (1961) and (2) that one of these factors--strength of character[1]--was highly related to success in college, controlling on high school performance and academic aptitude.

Bowles, Gintis and Meyer (1975) also use the peer-rating technique for assessing personality and a subset of Smith's 42 traits (derived from Edwards, 1972). They used a sample of 237 high school seniors to examine the relations among sixteen personality traits and academic success. A factor analysis of these traits implied that three factors summarize the sixteen measures. The authors named these factors Submission to Authority (consistent, identifies with school, punctual, dependable, externally motivated, perseverant, independent (-), and creative (-) loaded on this factor), Temperament (aggressive (-), temperamental (-), frank (-), predictable, tactful and creative (-) loaded on this factor), and Internalization of Norms (empathizes orders and defers gratification loaded on this factor). Submission to Authority and Internalization of Norms were found to be highly predictive of high grades after controlling for the effects of IQ.

To summarize, the studies reviewed indicate that persistence in educational pursuits, and related criteria of success, are determined by several noncognitive attributes and that at least a portion of their effect on attainment is independent of the effects of mental ability and social class background. Questions about the dimensionality of the relevant personality measures and about the direction of causality between personality and schooling experiences remain. Studies which attempted to reduce the dimensionality of the personality measures using factor analytic techniques failed to produce similar factors, and although conclusions implying directionality

of causation were made by some of the authors, the cross-sectional nature of most of the studies' data prohibited tests of causality.

Insights from the personological tradition in psychology provide a structure for thinking about personality and may be helpful for integrating the findings from these studies. Theories derived primarily from the humanistic tradition, such as Sullivan's interpersonal model (1953) and Murray's transactional model (1938), as well as empirically derived "factor theories" of personality (Cattell, 1965; Guilford, 1959; Eysenck, 1953) converge in implying that characteristics of individuals' temperaments can be described in terms of a twofold classification.[2] The introversion-extraversion axis describes a power dimension: Extraverts are outgoing, enthusiastic, talkative, adventurous, imaginative, seek social contact and being in the limelight and have good leadership qualities. The neuroticism-adjustment dimension has to do with emotive style. The adjusted person is emotionally stable, trusting, placid, relaxed, composed, optimistic and characterized by evenness of moods, tolerance and respect for others.

A motivational dimension of personality, describing attitudes, interests, values and needs of the individual can also be identified, although motivational and temperamental aspects of personality are by no means independent of one another. The high degree of communality between vocational interests and emotive characteristics has been demonstrated repeatedly (Guilford, 1959; Guilford et al., 1954; Darley and Hagenah, 1955). Typical findings of these studies are that students scoring high on social service or business vocational interests obtain high scores on measures of social adjustment, usually

considered a temperament dimension. The boundary between temperament and motivational modalities of personality is arbitrary (Guilford et al., 1954). In fact, Holland's (1959) scheme for assessing vocational interests is based on the premise that vocational preferences provide clues to personality in the same way that assertions of needs or styles of interpersonal relations do. From this point of view concepts such as interests, attitudes, needs, opinions, motives, values, aspirations, expectations, etc. can be regarded as manifestations of a common personal disposition, and the various devices used to assess these concepts can be expected to produce similar dimensions of personality.

I have reviewed empirical evidence suggesting links between a multitude of noncognitive characteristics and success in educational pursuits, and theoretical and empirical evidence which supplied a framework for classifying personality into a few global dimensions. The research to be reported addresses the following two questions: (1) Is the global classification implied by traditional personality theory useful for understanding who succeeds in educational pursuits, and (2) How do personality characteristics affect individuals' chances for success in the context of the educational process?

Method

Sample

Data were collected by Bachman (1975) for the Youth in Transition Project. A multistage probability sample of the nation's tenth grade boys was drawn using counties or metropolitan areas as the primary, schools as the secondary, and students as the tertiary sampling units. Interviews and questionnaires were administered to the subjects three times during their high school years (fall of 10th grade, spring of 11th grade, and spring of

12th grade), and the subjects completed questionnaires one year (1970) and five years (1974) after high school graduation. In all, 2213 boys from 87 schools responded in fall of 1966, 1886 (or 85.2%) responded to the first follow-up in spring of 1968, 1799 (or 81.3%) to the second follow-up in spring of 1969, 1620 (or 73.2%) to the third follow-up in spring of 1970, and 1628 (or 73.5%) to the fourth follow-up in spring of 1974. A more detailed account of the study design appears in Backman, O'Malley and Johnston (1978).

Measures

Multiple indicators of the constructs of interest were used whenever possible. It was not necessary to form actual composites for the latent variables because a computer program, LISREL (Joreskog and Sorbom, 1978) which estimates measurement parameters and infers latent variables to be used in the estimation of the structural model was used. The coefficients reported in Tables 2 through 4 are based on correlations among the latent variables and are comparable to coefficients based on disattenuated correlations. Three exceptions exist: Single indicators were used to measure academic performance at all timepoints and educational attainment at time 4. Perfect measurement was assumed for these constructs. And, a composite measuring socioeconomic status, formed by the researchers who made these data available, was used in lieu of multiple indicators of that construct. I was able to estimate the reliability of this composite from published information (Bachman, 1970), and use that information in the measurement model. Descriptions of background and schooling variables follow:

Socioeconomic Level (SEL): This index, measured at time 1, summarizes social and economic characteristics of the individuals' family of origin. It is comprised of six equally weighted measures: Duncan's prestige ratings of the father's occupation; years of education

attained by father and by mother; number of rooms per person in the home; number of books in the home; and a checklist of other possessions in the home. The KR-20 reliability coefficient for this scale is .72, and Bachman (1970, Appendix B) provides information on its construct validity.

Mental Ability (MA): Three tests of ability--the Ammons Quick Test of General Intelligence, the GATB-J test of Vocabulary Level, and the Gates test of Reading Comprehension--were used as multiple indicators of a latent mental abilities variable. All were measured at time 1. See Bachman (1970) for descriptions of these tests.

Grade Point Average (GPA): Respondent's report of his average grade received in his classes for the past year. This variable was measured at times 1, 2 and 3.

Significant Others' Influence (SOI): An index computed on the basis of two questions: "How do these people feel about whether you should go to college?" and "What if you decided not to go to college--how would they feel?" A score of "3" was given if the respondent was being encouraged to attend college and if bad feelings would result from nonattendance, a score of "2" was given if the respondent was being encouraged but the referent wouldn't care if he decided not to attend, and a score of "1" was assigned if the respondent was not being encouraged to attend college. Questions referring to father, mother, teacher and friend, measured at time 1, were scored in this fashion and used as multiple indicators.

Educational Attainment, Time 4 (EDATT): This variable is scored "1" if the respondent reported not having received a high school diploma as of the 1970 follow-up, "2" if he reported that he had received a high

school diploma but had not continued schooling, and "3" if he reported receiving a high school diploma and being "primarily a student."

Educational Attainment, Time 5 (EDATT): The following three variables were used as multiple indicators of this construct:

1) Information about educational pursuits completed or in progress recoded into a scale ranging from "0" (have not yet completed high school or earned a high school equivalency), through "6" (have attended or am attending a graduate or professional school after college).
2) "How many years of schooling have you completed?", and
3) "What is the highest degree you have earned?"

Noncognitive characteristics were measured using scales formed by the researchers who made the YIT data available. Factor analyses (to be reported) guided the combination of these subscales into groups to be used as multiple indicators of more general personality factors (comparable to 2nd order factors). Complete lists of the items comprising each of these scales appear in Bachman (1970, 1971). All scales used in these analyses were collected at times 1, 2, 3 and 4.

Anxiety (measured by six subscales):

1. Depression: Six questions asking the respondent whether he "feels down in the dumps, feels the future looks bright, feels things seem hopeless, feels bored, depressed and is bothered by noise" form this index.
2. Anomie: An index of eight items similar to: "Respondent feels no one cares what happens," and "Respondent gets the feeling life is not very useful."

3. General anxiety: Seven items similar to: "Respondent worries at night," and "Respondent gets the feeling that something bad will happen."
4. Resentment: A seven-item scale comprised of questions like: "Respondent is secretly jealous," and "Respondent feels cheated."
5. Anxiety and tension: Five items asking the respondent if he feels jittery, tense, nervous, relaxed (scored backwards), and worried.
6. Irritability: An eight-item scale of items such as "Respondent loses temper easily" and "Respondent feels like a powder keg."

Extraversion (measured by nine subscales):

1. Need self-development: A mean derived from respondents' self-ratings of 15 questionnaire items designed to measure the need for self-development such as: "When I learn something new, I like to set a goal for myself and try to reach it;" "I look for opportunities to better myself;" "I would be unhappy in a job where I didn't grow and develop;" "If I had to lower my goals because I just couldn't make it, that would really hurt."
2. Need for self-utilization: Questions similar to those comprising need to self-development were asked concerning use of one's existing skills and abilities. An eight-item measure of need for self-utilization asks questions such as: "I wish I had more chance to use some of my skills;" "I'd like to bring my usual performance in line with the best I've ever done;" "It upsets me when I get worse at something I was once good at;" "I am afraid that if I don't keep in practice I will lose my skills."
3. Kindness: Four items like: "Being kind to everyone" and "Turning the other cheek."

4. Honesty: Seven items like: "Always telling the truth" and "Never cheating."
5. Social responsibility: Four items like: "Being careful of a borrowed book" and "Borrowing money not expecting to repay it."
6. Reciprocity: Seven items like: "Returning a favor" and "Helping someone who helped you."
7. Social skills: Six items like: "Being well-mannered," "Behaving properly" and "Getting others to cooperate with you."
8. Academic achievement: Four items like: "Working hard to achieve academic honors" and "Striving for top grade point average."
9. Self-control: Five items like: "Always being patient" and "Not expressing anger."

Commitment (measured by two subscales and three recodes of occupational aspirations):

1. Social responsibility: Same as above.
2. Academic achievement: Same as above.
3. Prestige of occupational plans: Duncan Socioeconomic Index (a prestige ranking) of respondent's long-range occupational plans.
4. Type of voc. asp: Responses to an item requesting information about long-range occupational plans was recoded into five dichotomous variables measuring the six Holland types using a Census-Holland type conversion supplied by L. Gottfredson and V. Brown (1978). Because only the Realistic and Investigative types were highly related to educational attainment and 62% of the sample fell into these two categories, the other types were excluded from the remaining analyses. According to Holland's Scheme,

Realistic type individuals are asocial, conforming, frank, materialistic, practical, self-effacing and uninsightful. They often choose occupations like plumber or mechanical engineer. Investigative types are analytical, critical, curious, independent, introspective, methodical, pessimistic, rational, reserved, and unpopular, and work in occupations like physicist or TV repairperson.

Results

Structure of Personality

Exploratory factor analyses were performed to guide the assignment of indicator variables to latent personality variables. An original pool of 31 personality scales from the Youth in Transition Data and 3 recodes of occupational aspirations was reduced to 18 final variables on the basis of their availability in waves one through four of the data and their communality estimates. Several factor solutions were tried. A three-factor orthogonal solution using estimated communalities in the diagonal, shown in Table 1, was most defensible on the basis of the eigenvalues and theory about the structure of personality. The three-factor solution explained 60.6%, 58.7%, 57.4% and 59.1% of the variance in the observed variables at times 1, 2, 3, and 4 respectively and the factor loadings were similar at each timepoint.

Table 1 About Here

On the basis of these exploratory factor analyses and the theoretical perspectives reviewed earlier, three latent personality factors were identified. I have named the three factors Anxiety, Extraversion and Commit-

ment. Those scoring high on Anxiety often feel depressed, anxious, tense, resentful, irritable, and estranged. In short, they are maladjusted. Those scoring high on Extraversion are often motivated to develop their potentials and use their skills, they value kindness, honesty, self-control and socially acceptable behavior including having good manners, dressing appropriately and cooperating with people. They also value striving for academic achievement and are socially responsible in terms of repaying debts, returning favors and the like. These are sociable, conventional individuals. Those scoring high on Commitment aspire to prestigious careers, to scientific type occupations requiring analytical thinking, and not to manual type occupations requiring use of machinery and tools. These individuals also, but to a much lesser extent, value academic achievement and responsibility for such things as returning borrowed books and repaying borrowed money.[3]

These three factors are similar to the major dimensions of personality identified by personality theorists and reviewed earlier. The two major temperament factors--Extraversion and Anxiety--describe a power dimension and an emotive dimension. The Extraversion scale in the present analysis has elements of both Extraversion and Sociability or Adjustment (the opposite pole of Anxiety) and the Anxiety scale corresponds closely to the classical Neuroticism dimension. The Commitment dimension used in this study corresponds to the Motivation dimension described earlier.

Stability of Personality

Underlying any attempt to understand and predict behavior on the basis of personality characteristics is the assumption that individuals

can be characterized by relatively stable traits. This assumption has been the subject of a major debate in psychology, a debate which pitted the traditional trait model of personality (which assumes latent predispositions as determinants of behavior) against the situationist model (which regards environmental conditions as the main source of behavioral differences). The terms of this debate are peripheral to the purpose of this paper, so I will not expound upon them here. Excellent reviews are available elsewhere (Bowers, 1973; Endler and Magnusson, 1976). To grossly oversimplify, the lack of empirical evidence demonstrating stability of objective behavior across time and situation, and the low observed correlations between scores on self-report personality inventories and personality ratings by judges with objective behavior led some psychologists to suggest that the presumed stability of personality traits might be more due to the observer's cognitive need to classify and summarize than to actual underlying personality traits. Trait theorists retorted that the low stabilities and validities were a result of inappropriate procedures and called for more rigorous tests of trait theory. In a recent paper, Epstein (1979) reports the results of four such tests. He demonstrates that when measures of behavior are averaged over an increasing number of events, stability coefficients increase to high levels for all kinds of data (objective, self-ratings and ratings by others), and that the validity of self-report measures for predicting objective behaviors also increases. His paper provides strong evidence for the frequently suggested notion (Bowers, 1973; Green, 1978) that the low stability and validity coefficients for personality traits arises primarily from a

failure to take account of the high component of error of measurement in any single item of behavior.

The present paper adds some evidence for the stability and validity of personality. Table 2 shows reliability and stability coefficients for the three personality factors measured at four points in time as well as validity coefficients relating these personality factors to family background, ability, and schooling variables. The table entries, except for the reliability estimates, are maximum likelihood (LISREL) estimates of correlations among latent variables. They are comparable to disattenuated correlations. Also, in order to make some correction for systematic co-

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Table 2 About Here

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variation among the personality measures at any given timepoint which is not due to the latent personality construct, I removed the constraint that required the residual terms for the personality variables to be uncorrelated within timepoints. At every timepoint, the correlation between the Anxiety and Extraversion residuals was significant at the nominal .01 level, but only at time 1 were the other residual correlations significant. Of course, we do not know what the causes of this systematic covariation are, but a likely candidate is the fact that most of the personality items, especially those measuring the elements of the Anxiety and Extraversion factors, appeared sequentially on the questionnaire and had similar response formats. Relaxing the orthogonality constraint on the residual terms, which is comparable to specifying that an additional latent factor accounts for some of the variance in the observed variables, lowers the coefficients reported in Table 2 by about .2 (on the average). Hence,

these coefficients are conservative estimates of the stability and validity of the personality factors, and as such are to some extent immune from criticisms about inflation due to method variance (Mischel, 1968).

Reliability coefficients appear in the diagonal of the left half of the table.[4] All personality factors are measured with modest (.539) to high (.907) reliability. For Anxiety and Extraversion, the reliabilities are fairly stable across timepoints, but for Commitment it drops from .722 at time 1 to .539 at time 4.

The pattern of stability coefficients[5] shown in Table 2 is as expected: Each personality factor's correlation with the same factor measured at a different time is much higher than with any other factor measured at any time. The magnitude of the stability coefficients ranges from .268 (from time 1 to time 4 Extraversion) to .798 (time 3 to time 4 Anxiety). The stability coefficients for the personality measures are on the average higher than the stability coefficients for reported grade point averages (ranging from .448 to .639) across the first three timepoints of the survey.

The foregoing demonstrates a high degree of internal validity for the measures of personality characteristics. Of greater interest to the situation vs. trait debate is the external validity of the measures. Critics of the trait position have pointed out that high stability coefficients for traits measured with the same response medium are not necessarily indicative of trait stability (Mischel, 1968). Low correlations between scores on personality inventories and other objective behaviors also have raised questions about the validity with which generalizations about higher-order constructs can be made from results based on the operational variables. The left half of Table 2 demonstrates that <u>something</u> is being

reliably measured and is stable across timepoints, even when systematic variance due to an undefined factor is removed. Examination of these variables' correlations with other objective measures will contribute evidence about their external validity.

The validity coefficients reported in the right half of Table 2 are correlations of the personality factors with reports of specific behaviors or experiences that have many known causes other than the personality factors of interest here. As such, large correlations are not expected. With few exceptions, though, the Anxiety, Extraversion and Commitment measures have highly significant correlations with the seven behaviors reported in the table. Correlations with Anxiety are low (-.035 to -.143), with Extraversion somewhat higher in the earlier years (for time 1, from .143 to .272) but decreasing during the later years, and with Commitment they are moderate to high (.300 to .568).

Larger correlations are found between the personality factors and other behaviors with higher components of subjectivity. Although I did not include such variables in the present analysis, hints about the external validity of my measures may be gleaned from correlation matrices supplied by Bachman (1975, Appendix D). He reports correlations of composite personality measures similar to mine[6] with measures of many behaviors. The pattern of correlations accords with expectations, i.e., they evidence convergent and discriminant validity. The following correlations, all based on time 1 measures, serve as examples (see footnote 6 for explanation of variables):

	Job Information Test	Somatic Symptoms	Interpersonal Aggression
Negative Affect	-.037	.557	.247
Social Values	.146	-.258	-.303
Occupational Prestige	.299	-.205	-.120

A test of job information is expected to be more highly correlated with a measure of commitment to conventional career goals than to level of Anxiety, just as is a higher correlation between negative affect (Anxiety) and somatic symptoms than job information or aggression.

Effects of Personality on Educational Attainment

The preceeding section demonstrated that a classification of personality characteristics into three global dimensions--Anxiety, Extraversion, and Commitment--is psychometrically and theoretically defensible. The remainder of this paper addresses the usefulness of this classification for understanding success in educational pursuits.

Figure 1 About Here

A model of educational attainment appears in Figure 1. This model is a modification of the Wisconsin model of status attainment, which has received empirical support from researchers working in the status attainment tradition using a variety of data sources (Alexander, Eckland and Griffin, 1975; Wilson and Portes, 1975). This model is certainly an oversimplication of the educational process; variables likely to affect educational attainment are omitted, and the causal ordering specified for the included variables is questionable. Nevertheless, it is suitable for the present purpose which is to test for gross effects

of noncognitive characteristics on educational attainment and on other important schooling variables.

Table 3 About Here

Table 3 summarizes the effect of the noncognitive characteristics measured in 1966 on educational attainment measured in 1974. From this table we learn that the zero-order association between Extraversion and educational attainment is reduced to nonsignificance when controls for mental ability and socioeconomic status are included (Column 2). This does not mean that extraverted individuals are not more successful at educational pursuits than are others. It does mean that whatever effect being extraverted has on educational attainment is shared in common with the effects of intelligence and social class.

The effects of Anxiety and Commitment on educational attainment remain highly significant even after controlling for the effects of background characteristics. A further decomposition of the effects of personality variables on educational attainment shows that the effect of Anxiety is direct, i.e., not mediated by the other schooling variables in the model, while Commitment affects educational attainment both directly and indirectly. This means that being highly committed to educational and occupational goals helps students in two ways: First, they get higher grades than students of similar backgrounds and intelligence levels who are less committed, thus indirectly affecting educational attainment because the grade advantage is translated into greater degrees of success at later stages.[7] Second, educational attainment is directly affected by higher levels of Commitment. That is, even controlling on

the schooling variables in the model does not reduce the effect of Commitment to zero. Similarly, anxious students are less likely to persist in school than are better-adjusted students of similar backgrounds, intelligence levels, and with similar grade-point averages and degrees of influence from others to continue schooling.

A word of caution about interpreting indirect effects is in order here. The causal ordering imposed by the model puts a limit on the magnitudes of the effects of certain variables. For example, the model used here places Commitment prior to grade point average and in so doing overestimates the effect of Commitment on educational attainment to the extent that a portion of the correlation between Commitment and grades is due to grades affecting Commitment. This is a persistent but seldom recognized problem whenever causality is implied from correlation.

Passive research, like the research reported here, allows the investigator only to speculate about causality because models specifying different causal orderings receive empirical support from the same data. For example, Bachman and O'Malley (1977) test a causal model of educational attainment that places self-esteem subsequent to socioeconomic level, academic ability and academic performance. They found that self-esteem had little direct effect on educational attainment, i.e., that the correlations between these two variables was explained by the prior causes. They concluded that the noncognitive attribute, self-esteem, is highly dependent upon academic ability and performance in school and has little or no independent effect on educational attainment.

Bowles and Gintis (1976) foster a different view of the world, Their research is alleged to expose the educational system as a mechanism for

perpetuating the unequal distribution of resources by conditioning individuals to accept their positions in the economic hierarchy. "Teachers are likely to reward those who conform to and strengthen the social order of the school with higher grades and approval, and punish violators with lower grades and other forms of disapproval, independent of their respective academic and cognitive accomplishments" (p. 39). They claim "striking confirmation" of their perspective on the basis of a study (reviewed earlier) which found that many traits--consistency, dependability, persistence, identification with school, punctuality, external motivations, creativity, aggressiveness and independence--had significant partial correlation with grades after controlling for ability test scores. The implied model in these analyses was that ability is prior to personality, which is prior to grades. They conclude that teachers reward subordinancy and discipline while penalizing creativity and independence, and that the educational system perpetuates patterns of inequality, repression, and class domination.

The foregoing discussion illustrates the point that path analysis, especially with nonrecursive models and cross-sectional data, is not by itself an adequate tool for choosing among different possible causal orderings for correlated variables. It is possible that the two studies just discussed arrived at different conclusions concerning the effect of personality variables on educational outcomes simply because they assumed different causal orderings. The implication for the present study is that the model used in the foregoing analysis is bound to overestimate the total and indirect effects of Commitment on educational attainment. In order to examine this possibility and to get a more detailed picture of the operation of the noncognitive characteristics in the schooling

process, I now turn to a more fine-grained analysis which uses data from all five timepoints. This analysis attempts to infer meaning from a series of five rather than two snapshots of the schooling process.

Table 4 reports the results of this analysis, and requires some explanation. The table entries are standardized maximum likelihood estimates computed using LISREL, a computer program which simultaneously derives estimates for a measurement model and a structural model (Joreskog and Sörbom, 1978). The table reports the estimates for the structural model, i.e., the model relating latent variables. Figure 2 shows this structural model. Personality factors at each timepoint are caused by the corresponding personality measure at the preceeding timepoint and by the students' retrospective report at the same timepoint of his grade point average for the past year. These reports of grade point average as well as the measures of educational attainment are assumed to be caused by the personality measures and the grade point average from the previous timepoint. Mental ability and socioeconomic status have no causes within the system and they are assumed to cause all subsequent variables. To account for "residual" covariation among the personality measures correlation among their error terms within each timepoint was allowed. Making use of such prior knowledge in this way results in more realistic estimates of the true effects of the personality factors.

Table 4 and Figure 2 About Here

Table 4 shows more detail about the educational attainment process than was possible in the earlier analysis. Working back from the ultimate criterion of interest, educational attainment four years after high

school graduation, we see, not surprisingly, that educational status one year after high school is its largest determinant. Commitment, mental ability and socioeconomic status also have highly significant effects. The causal effect of Commitment may be interpreted as meaning that of people with similar levels of intelligence and social class backgrounds who started with similar educational statuses four years earlier, those more committed to higher level jobs and who value academic prowess more persisted in school longer.

What causes individuals to have high levels of Commitment and to pursue educational careers directly out of high school? Table 4 implies mental ability and socioeconomic status, again, as well as Commitment and high grades at time 3 affect time 4 Commitment and educational status.

Tracing back one more step to look at the causes of Commitment and high grades at time 3 we see a similar pattern of effects, but this time the coefficients measuring the effect of Anxiety on grades at time 3 reaches significance, and an effect for social class background appears only for Commitment, not grades. Looking at the causes of Anxiety, Commitment and the retrospective reports of grades at time 2, we see that previous Anxiety and prior grades affect Anxiety; previous Commitment, prior grades, mental ability and social class background affect Commitment; and mental ability, Anxiety and prior grades affect grades at time 2. And finally, grades at time 1 affect Anxiety at time 1.

The foregoing may be summarized as follows: Success in educational pursuits depends upon prior success in the schooling system, upon "input" resources to the system, and upon two global dimensions of personality: Commitment to educational and occupational goals and, to a lesser extent,

freedom from anxiety. Extraversion has no measurable effect on educational attainment. The effect of Commitment on attainment increases as graduation nears, first appearing by increasing grades in 12th grade, then affecting educational status after high school. Conversely, Anxiety has its effect early in the process by decreasing grades in the 10th and 11th grades, but does not appear to decrease later grades or attainments.

Table 4 also tells us something about the sources of the personality dimensions. Anxiety is not well explained by the model. High grades are anxiety-reducing, but mental ability and social class background are virtually unrelated to Anxiety across the four timepoints. Commitment, on the other hand, is caused by mental ability and socioeconomic status as well as by grades. If we discount the large effects of the background variables on Commitment at time one as partly due to being measured concurrently with the same method, it appears that the effect of mental ability on Commitment increases over the high school years and the effect of socioeconomic background jumps upward when students "get out into the real world" after high school graduation.

The large effect of Commitment on educational success is particularly interesting because this characteristic is highly linked to background resources. Is a system of status allocation so dependent upon "accidents of birth" fair or desirable? Are teachers guilty, as Bowles and Gintis (1976) suggest, of perpetuating the unequal distribution of resources across social classes by rewarding those characteristics which result from a higher social class upbringing? Table 4 addresses this question. It shows that Commitment has only minor effects on subsequent grades (only

at time 3 does the effect reach an acceptable level of significance). But previous grades have highly significant effects on Commitment at every relevant timepoint. This suggests that doing well in school helps students to form commitments to conventional goals. It does not suggest that teachers deliberately reward characteristics more commonly found in youths from higher status families irrespective of the individuals' academic achievements.

Discussion

These analyses suggest that people may be described by three global nonintellective dimensions--Anxiety, Extraversion and Commitment--which appear highly stable across time. Two of these dimensions, Anxiety and Commitment, help to determine the success or failure of individuals in academic pursuits. By piecing together "snapshots" of approximately 2000 boys at five points in their educational careers, and by filling in the gaps somewhat with retrospective reports, it is possible to get an idea about how these characteristics help and hinder students.

The results imply that Commitment has a sizeable direct impact on later educational attainment. It appears that the advantages of being born into a higher social class family and of being intelligent get translated over the school years into a high degree of commitment to occupational and educational goals. This commitment increases in importance while the direct effect of the background characteristics decreases.

The results also point to the importance of grades in school as a mediator of the effect of Anxiety and Commitment. The grades students receive are to some extent a response to the students' levels of Anxiety

and (to a much lesser extent) Commitment. That is, teachers reinforce certain noncognitive characteristics in addition to academic performance. But these analyses show that grades operate more to mold individuals' personalities after the fact than as a response to personality characteristics. Low grades cause Anxiety--depression, resentment, tension, irritability and anomie. High grades cause individuals to value academic achievement more, raise their career aspirations, become more analytical-minded and more socially responsible.

Hirschi's (1969) notions about the dependence of occupational and economic success upon "social bonding" provide an integrating theme for this paper. According to this perspective, individuals are molded by their experiences in the family, the school, peer group and working environments. To the extent that they are successful in conventional endeavors, their "bonds" to society, i.e., their conformity to the values, norms and beliefs of the prevailing social system, are strengthened. To the extent that they are unsuccessful in conventional endeavors, academically as well as socially, students' bonds to society weaken. They become detached from "pro-social" others, less involved in conventional activities, less committed to educational and occupational goals, and more sceptical about the validity of previaling social rules.

The analyses reported here lend support to this perspective, especially with regard to the importance of successful experiences during the school years for strengthening individuals' bonds to the school social order. Students react to grade failure by drawing away; they become resentful, detached and anxious. They respond to school success by renewing commitment to conventional goals.

The implications for schools as socializing agents are clear. Schools must accommodate an increasingly heterogeneous mix of students with divergent needs and demands (Gottfredson, 1980). To continue to focus on academic accomplishment and to maintain traditional reward structures is to prohibit many individuals from ever experiencing success in school, to offer instead anxiety-provoking and alienating experiences, and to limit their chances of later-life success.

Footnotes

1. Variables comprising this factor are: quitting (-), languid (-), self-reliant, responsible, insistently orderly, socially mature, resourceful, inquisitive and prone to daydream (-).

2. The adequacy of the two-dimensional scheme as compared to schemes which identify more than two factors has been questioned. Cattell (1965), Guilford (1959) and Tupes and Christal (1961), to cite a few dissenters, would argue that meaningful factors which should remain distinct are slurred in the two factor classification scheme. Whereas Eysenck prefers a general two-factor model, Cattell sees sixteen relevant dimensions and Guilford thirteen. Tupes and Christal (1961) use Cattell's scales on eight different samples and conclude that there are only five consequential factors. More recently, Hogan (1979) suggests a five-category scheme of traits that characterize those who attain status in our society. The issue seems to be the level of generality of the solutions--an issue which should be resolved according to the needs of the particular project. Solutions based upon primary factors give a more detailed picture of personality at the risk of lowered reliability and separability (Eysenck, 1972). As for predictive validity, however, the utility of even the higher-order factors remains a matter of dispute.

3. The latter two variables, academic achievement value and social responsibility value, are included in this factor in later analyses not on the basis of the final factor analysis, but because in earlier exploratory analyses they loaded on this factor, because they fit well with the factor on an intuitive level, and because later confirmatory factor analyses indicated that a model including these variables on the Commitment factor fits the data significantly better than does a model excluding them.

4. These reliability estimates were computed using stepped-up average inter-item correlations. The implied model assumes equal weighting for the indicators. In fact, the latent variables were formed using maximum likelihood estimates for the factor loadings. These loadings were roughly equal for the variables measuring Anxiety and Extraversion, but for Commitment the loadings for the two personality subscales were much lower than for the three recodes of occupational aspirations.

5. The means of the three personality constructs are highly stable. They are virtually equal across the four timepoints.

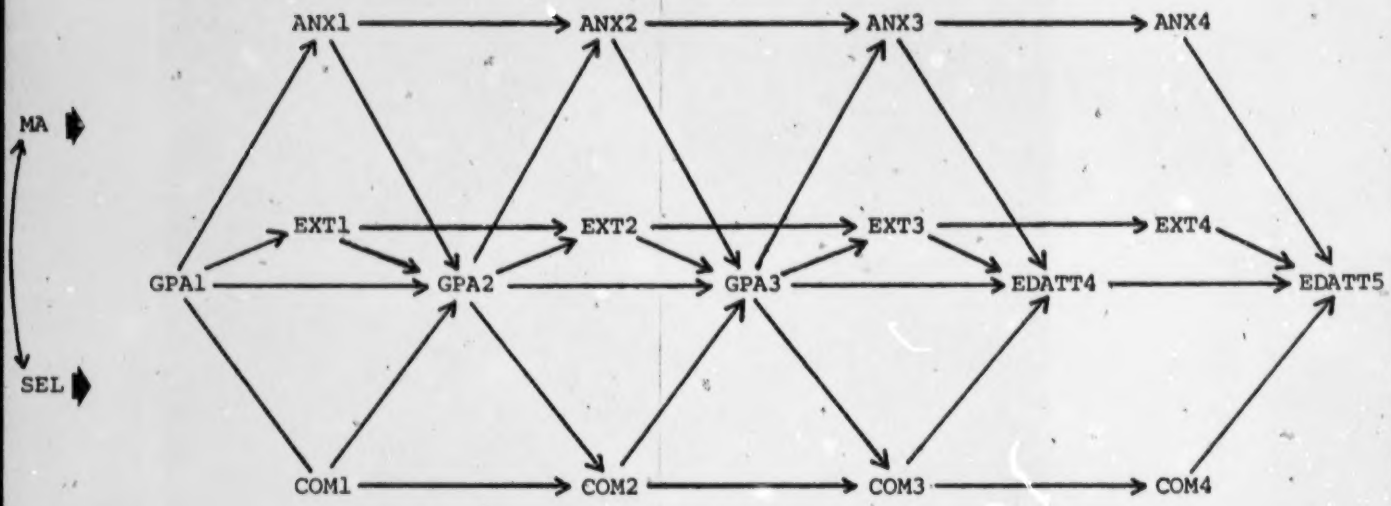
6. Bachman's "Negative Affective States" Scale consists of the same six variables I have used to measure Anxiety. His "Social Values" scale uses six of the nine variables in my Extraversion Scale. Duncan prestige ranking of occupational aspirations is the variable with the highest loading on my Commitment composite.

7. The results of a detailed analysis of the effects of personality on each of the schooling variables implied that anxious students get lower grades and that extraverted and committed students get higher grades than others. Also, extraverted and highly committed students are more likely to be influenced by significant others to continue schooling. None of these effects are spuriously due to mental ability and socioeconomic level. They also showed that the effect of significant others' influence on educational attainment disappears after controlling for background factors, but that the effect of grades remains highly significant. Hence, although personality factors do affect influence from others, that effect has no consequence for educational attainment. All indirect effect of personality on attainment

operates by raising one's grades, according to the model used in this analysis.

Figure 2

A Longitudinal Model of Educational Attainment

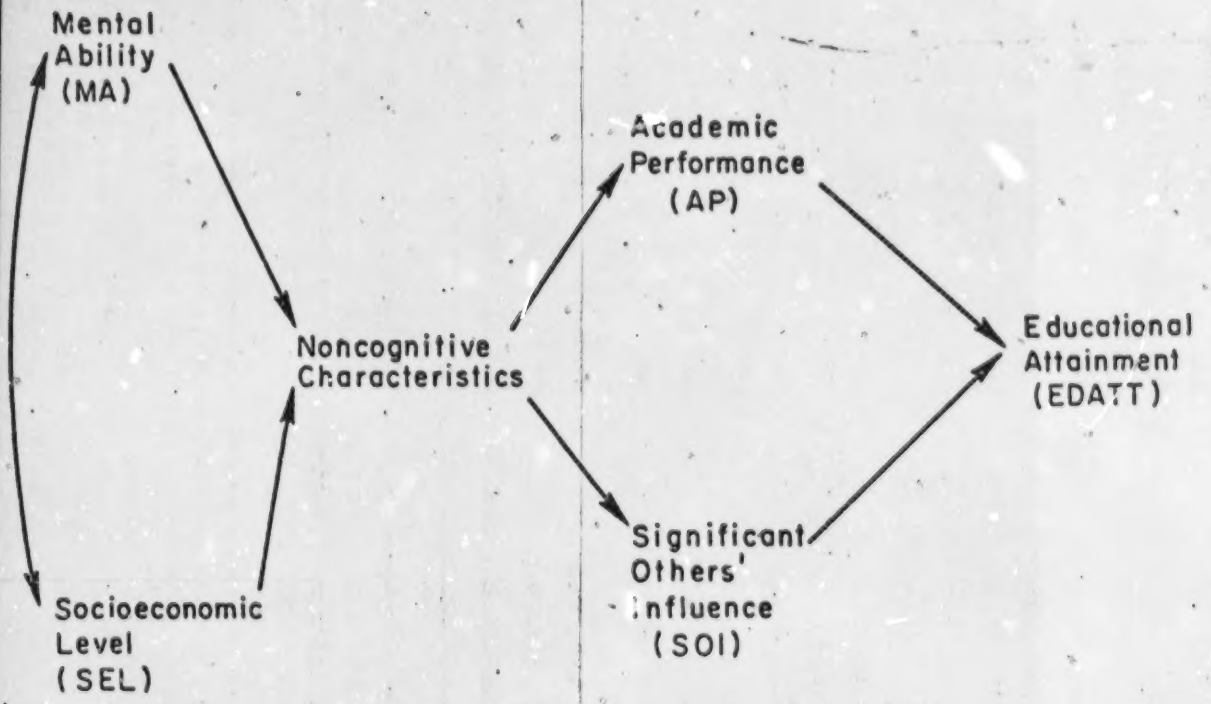


Note: Mental Ability and Socioeconomic Level cause all subsequent variables.

Abbreviations:

MA= Mental Ability
SEL= Socioeconomic Status
GPA= Grade point average
EXT= Extraversion
ANX= Anxiety
COM= Commitment
EDATT= Educational Attainment

Figure 1
A Model of Educational Attainment



Note: Although some paths have been omitted for simplicity, the model is fully recursive.

Table 1

Varimax Rotated Factor Loadings
for a Three-Factor Solution
of 18 Personality Variables
Measured at Time 1

Variable	Factor I	Factor II	Factor III	Communality[a]
Depression	.807[b]	-.131	-.030	.629
Anomie	.684	-.149	-.138	.495
Anxiety	.720	.146	-.016	.505
Resentment	.813	-.125	-.081	.619
Anxiety and Tension	.726	.015	.009	.529
Irritability	.743	-.129	-.013	.528
Need for self-development	.043	.513	.182	.548
Need for self-utilization	.121	.499	.156	.539
Kindness value	-.034	.683	-.050	.544
Honesty value	-.175	.625	.121	.512
Reciprocity value	-.065	.781	.043	.602
Social skills value	-.058	.800	.035	.627
Self-control value	-.102	.803	-.020	.659
Social responsibility value	-.182	.505	.232	.449
Academic ach. value	-.098	.771	.112	.571
Realistic occ. asp.	.032	-.170	-.788	.584
Investigative occ. asp.	-.058	.058	.547	.289
Prestige of occ. asp.	-.075	.140	.904	.625

[a]Communalities were estimated with an iterative procedure (Nie, Hull, Jenkins, Steinbrenner and Bent, 1974, p. 480).

[b]Underlined entries are the loadings for variables that were later included as indicators of each latent variable.

Table 2

Reliability, Stability and Validity Coefficients for Personality Factors at Four Timepoints

Variable Name and Number	Variable Number											SEL	MA	GPA	GPA	GPA	EDATT	EDATT
	1a	1b	1c	2a	2b	2c	3a	3b	3c	4a	4b	4c	t1	t1	t1	t2	t3	t4	t5
Time 1:																			
1a) Anxiety	.886	-.205	.137	.068	-.123	-.119	.528	-.079	-.102	.423	-.052b	-.091	-.110	.127	-.132	-.143	-.136	-.101	-.104
1b) Extraversion		.881	.218	-.136	.576	.190	-.124	.378	.167	-.105	.268	.150	.143	.272	.238	.214	.194	.163	.167
1c) Commitment			.722	-.077	.139	.682	-.107	.072	.514	-.099	.029a	.422	.474	.522	.379	.329	.306	.373	.379
Time 2:																			
2a) Anxiety				.899	-.191	-.094	.778	-.129	-.074	.620	-.092	-.052b	.035a	.056a	-.100	-.133	-.134	-.068	-.068b
2b) Extraversion					.863	.158	-.157	.666	.135	-.131	.483	.104	.025a	.214	.198	.218	.201	.130	.128
2c) Commitment						.654	-.119	.088	.701	-.107	.042a	.507	.455	.499	.384	.414	.365	.422	.411
Time 3:																			
3a) Anxiety							.897	-.192	-.095	.798	-.133	-.085	.111	.116	-.115	-.140	-.143	-.105	-.113
3b) Extraversion								.854	.083	-.156	.729	.051b	.057b	.123	.129	.152	.158	.091	.033
3c) Commitment									.581	-.088	.040a	.646	.423	.480	.336	.363	.361	.482	.455
Time 4:																			
4a) Anxiety										.907	-.186	.069	.103	.117	-.104	-.123	-.125	-.096	-.111
4b) Extraversion											.864	.024a	.089	.064	.080	.098	.102	.042a	.048b
4c) Commitment												.539	.488	.504	.300	.304	.300	.404	.491

[a]Coefficient does not reach nominal .05 significance level.

[b]Coefficient does not reach nominal .01 significance level.

Note. All coefficients are significant at the $p < .01$ level, unless otherwise noted. Table entries are maximum likelihood estimates of correlations among latent variables. Stability coefficients across time points are underlined. Reliabilities (average correlations of variables comprising the scales stepped up using the Spearman-Brown prophecy formula) appear in the diagonals. See text for full names of variables used in validity test.

Table 3

Decomposition of Effects of Predictors (1966) on Educational Attainment (1974)

Personality Factor	total assoc.[a]	Total effect	direct effect	indirect effect
Socioeconomic Level	.478**	.281**	.248**	.033
Mental Ability	.507**	.335**	.147**	.188**
Anxiety	-.193**	-.108**	-.094**	-.014
Extraversion	.198**	.038	.007	.031
Commitment	.424**	.158**	.084**	.064**
Grade Point Average	.495**	.298	.298**	--
Significant Others' Influence	.274**	.033	.033	--

** $p < .01$

[a]Values for zero-order correlations of latent variables differ somewhat from those reported for the same constructs in Table 2. Each Tables' figures are based on different Maximum Likelihood Solutions involving different sets of variables, and thus are not expected to be equal.

Note. Total association is the zero-order correlation between educational attainment and the predictor. A variable's total effect is the variable's standardized regression coefficient in an equation predicting educational attainment. Only variables which, according to the model in Figure 1, enter the equation prior to or at the same time as the variable in question are used. A variable's direct effect is the variable's standardized regression coefficient in an equation predicting educational attainment from SES, Ability, Anxiety, Extraversion, Commitment, Grade Point Average and Significant Other's Influence. A variable's indirect effect is the difference between its total and direct effects.

Table 4

Standardized Maximum Liklihood Estimates for a Multi-wave Longitudinal Model of Educational Attainment

Predictor Variable Names and Numbers	Criterion Variables: Time 1				Time 2				Time 3				Time 4				Time 5 Educational Attainment
	3	4	5	6	3	4	5	6	3	4	5	6	3	4	5	8	
1) Socioeconomic Level, time 1	-.049	-.041	.242**	.038	.037	-.153**	.102**	.005	-.065*	-.085**	.062*	.010	.002	-.064*	.186**	.247**	.098**
2) Mental Ability time 1	-.054	.228**	.298**	.463**	.035	.118**	.079**	.163**	-.028	.014	.116**	.161**	-.028	.014	.153**	.138**	.167**
3) Anxiety, t-1					.667**			-.042*	.773**			-.043*	.795**			-.005	-.022
4) Extraversion, t-1						.546**		.028		.656**		.035		.724**		.034	.019
5) Commitment, t-1							.536**	.028			.587**	.052*			.494**	.239**	.174**
6) Grades, t	-.090**	.141**	.157**		-.065**	.093**	.173**		-.008	.044*	.077**						
7) Grades, t-1								.531**				.529**				.193**	
8) Educational Attainment, time 4																	.454**
$(1 - \psi^2)^a$	.024	.089	.330	.237	.451	.356	.523	.433	.612	.449	.521	.443	.638	.535	.487	.387	.527

**p < .01
*p < .05

Note--Predictors 3 through 5 are measured once at each of times 1 through 4, and grades are measured at times 1, 2 and 3. The coefficients reported in the table for variables 3 through 5 refer to the measurement taken at the time before the criterion variable was measured. The grades variable in each equation is the variable measured at the same time as the criterion, because the specific question requested that the students report their average grades for the past year.

[a] $(1 - \psi^2)$ is comparable to the R^2 statistic.

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